

Serial No. 10/586,837

G&P-5436

Amendment

Responsive to Office Action dated April 28, 2009

REMARKS**Pending Claims**

Claims 1-12 are pending. No claims have been amended. No new matter has been added.

Claim Rejections Under 35 USC §102 and §103

Claims 1 and 6-12 are rejected under 35 USC §102(e) as being anticipated by Endoh et al. (US 7,359,531). Claims 2-5 are rejected under 35 USC §103(a) as being unpatentable over Endoh et al. (US 7,359,531), as applied to claims 1 and 6-12 and further in view of Choshi et al. (US 7,327,861). Applicants request reconsideration of the rejection for the following reasons.

The embodiments of the present inventions relate to a vein authentication device which irradiates a finger, for example, with infrared light so that an image pickup device can pick up a blood vessel or vein image. In particular, claim 1 sets forth an interface on which a part of a living body whose image is to be picked up is placed, one or more light sources for emitting infrared light, an image pickup unit for picking up a blood vessel (or a vein image as set forth in independent claims 11 and 12), of the part of the living body using infrared light emitted from the light sources. Additionally set forth is an image computing unit, a light shielding unit for shielding infrared light emitted from the light sources and preventing the infrared light for traveling in an image pickup direction of the image pickup unit.

Independent claims 1, 11 and 12 further set forth that the interface has an opening that is opened in the image pickup direction of the image pickup unit. Independent claim 11 additionally sets forth that the light sources are placed laterally to the opening, and the light

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sources emit infrared light having an optical access in the image pickup direction to irradiate the part of the living body with infrared light from an image pickup side of the part of the living body. Further, claim 11 states that the light shielding unit is provided between the opening and the light sources and to more than half of an upper portion of the light sources on the opening side.

Independent claim 12 sets forth that the light sources are placed laterally to the opening, and the light sources emit infrared light having an optical axis that is tilted in a direction opposite to the opening to irradiate the part of the living body with infrared light from an image pickup side of the part of the living body. Claim 12 additionally sets forth that the light shielding unit is provided between the opening and the light sources, and to an upper portion of the light sources on the opening side.

As shown in Figure 4A, the light shielding unit (finger rests 25), cover more than half of the upper portions of the light sources 23 on the opening side. This causes the infrared light emitted from the light source 23 to be directed toward a direction opposite to the opening 30. The finger rests 25 are placed such that the divergence of infrared light from the light sources 23 does not include the image pickup direction 320. Accordingly, the finger rests 25 are set such that every component of infrared light from the light sources 23 travels toward a direction opposite to the opening 30. *See* page 18, lines 9-19 of the Specification, for example.

The infrared light that is reflected from the skin surface of the finger 1 is shielded by the light shielding unit or finger rests 25 and does not reach the top of the opening 30. Infrared light 326 which is a part of the infrared light that has entered into finger 1, is scattered without reaching a depth where finger veins 62 run. As shown in Figure 4A, the

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infrared light 326 that is scattered before reaching the depth where the finger veins 62 run changes its travel direction and very little of the infrared light 326 reaches the top of the opening 30. The infrared light 324 which is scattered after reaching the depth where the finger veins 62 run, is partially absorbed by the finger veins 62. Another part of the infrared light 324, which carries the finger vein pattern information, reaches the top of the opening 30. The image pickup unit picks up the infrared light 324 which carries the finger vein pattern information which allows the vein authentication device to pickup a clear image of a finger vein pattern in a pickup target portion. *See* pg. 19, line 5 – pg. 20, line 4, for example.

It is a feature of the embodiments of the present invention to provide a vein authentication device which includes an image pickup unit to pickup a clear blood vessel image as in claim 1 or a clear vein image as in claims 11 and 12, so that the image pickup unit does not pickup infrared light that is reflected from the skin surface of the finger 1 and that the image pickup unit does not pickup infrared light that is scattered before reaching a depth where the finger veins run. *See* pg. 16, line 22 – pg. 17, line 8, for example.

Accordingly, it is a claimed feature, as set forth in claim 1, that a light shielding unit is provided for shielding infrared light emitted from the light sources and prevents the infrared light from traveling in an image pickup direction of the image pickup unit. Further, claim 11 sets forth a light shielding unit for shielding infrared light emitted from the light sources such that the light shielding unit is provided between the opening and the light sources and to more than half of an upper portion of the light sources on the opening side. Claim 12 sets forth a light shielding unit for shielding infrared light emitted from the light sources such that the light shielding unit is provided between the opening and a light sources and to an upper

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portion of the light sources on the opening side. *See* page 16, lines 22 – page 17, lines 8, for example.

Endoh is relied upon in the Office Action for disclosing a personal verification apparatus which photographs a blood vessel image of the palm of a hand and is built into a mouse, a keyboard or the like. In particular, Endoh discloses a visible light cut filter 50 cutting off visible light, a CMOS camera 51 having the filter 50 to photograph a palm of a hand and an image processing unit 52 performing a binary coding process on a blood vessel image photographed by the CMOS camera 1. *See* col. 9, lines 22-28 of the reference. However, Endoh does not disclose the claimed combination of elements as set forth in independent claims 1, 10 and 11.

Specifically, the Office Action states that Endoh is relied upon for disclosing a light shielding unit, however Endoh does not disclose a light shielding unit for shielding infrared light emitted from the light sources and preventing the infrared light from traveling in an image pickup direction of the image pickup unit as set forth in claim 1. Further, regarding the rejection of claim 11, Endoh is relied upon for disclosing a visible light cut filter 50, however visible light cut filter 50 merely attenuates optical power in the visible light region, while transmitting a light in the near-infrared light region. Accordingly, visible light cut filter 50 is for cutting off visible light. Whereas, claims 1, 11 and 12 set forth a light shielding unit for shielding infrared light emitted from the light sources. Further, claim 11 sets forth that the light shielding unit is provided between the openings and the light sources and to more than half of an upper portion of the light sources on the open side. Additionally, claim 12 states that the light shielding unit is provided between the opening and the light sources and to an upper portion of the light sources on the opening side.

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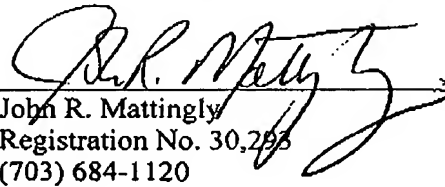
Claims 2-5 are rejected as being unpatentable over Endoh as applied to claims 1, 6-12 and further in view of Choshi. However, Choshi does not overcome the deficiencies noted with respect to Endoh. Further, these claims are at least patentable for depending from claim 1 which is asserted to be patentable for the foregoing reasons. Accordingly, the rejection of claims 1-12 under 35 U.S.C. §102(e) and 35 U.S.C. §103(a) should be withdrawn.

Conclusion

In view of the foregoing, Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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